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Are Shippers satisfied with the diversified Provision of Logistics Service by Shipping Companies?
– A Study between the UK and South Korea *

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Contents

Abstract

This paper explores the current feature of the service provision in the shipping industry and contributes to a more thorough understanding of the industry. A questionnaire was developed to examine the performance of service providers assessed by international shippers in the UK and South Korea. We find that British shippers are more likely to be satisfied with the diversified service provision than Korean shippers. We also find that three service functions such as Intermodal Co-ordination, Paying Customs Duties, and Issuing the Bill of Lading show a large mean difference of service performance among the service providers. The projected outcome of this research is intended to be a guide-line for the future research on this important issue in the container shipping industry.

Key Words: liner shipping, logistics service providers, shipping industry, Korea, UK

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I. Introduction

The global economic slowdown affected the liner shipping industry leading carriers to significantly reduce capacity along the major trade lanes. Many of major shipping lines have performed rather poorly in the last couple of years. A large number of shipping lines have tended to diversify their activities into other business areas, in particular the logistics industry, where they perceive that there exists a sufficient customer demand to yield greater levels of profitability.[1] Another factor of this diversification strategy is relates to the desire on the part of shipping companies to capture a benefit of the container trade further back along the supply chain or, even more preferably, at source. In order to maintain their newly operated services, shipping lines have been keen to form new types of co-operation between carriers and also actively seeking merger and acquisition between them.

Considering its potential influence and importance, there has been little research analysing the perspective of international shippers on this diversification of liner shipping companies into the provision of a wider range of logistics services. This paper explores the current logistics service provision of liner shipping companies, with particular reference to the perspectives of international shippers in South Korean and the U.K.

The research has carried out on the basis of a comparative study of U.K. and South Korea, strategically located at the gateway to Western Europe and to the North East Asia respectively. Both countries have been playing a major role in the shipping world. The paper attempts to find out general aspects of liner shipping in the two countries and investigates the operation of logistics service from the perspective of international ship -pers. A comparison of international shippers' judgements on the logistics service in the liner shipping industry is particularly worthwhile.

1 Beddow(2001), pp.57-65; Evangelista(2004), pp.13-15.

The paper is organized as follows. Next Section provides a literature review. The empirical study is presented in Section III, and Section IV discusses the conclusion and future study.

II. Literature review

Shipping lines need to take appropriate action to improve their level of service in order to satisfy needs of more sophisticated shippers.[2] One of the possible courses of action for liner shipping companies is to pursue a general logistics strategy stretching far beyond the arena of maritime shipping. This implies an integrated system encompassing all aspects of logistics related to the carriage and care of cargoes, such as inland transport and distribution, packing, labelling and warehousing.

Shipping lines enter the industry for logistics services, because they believe that multiplication of service area may yield higher profits than the only traditional service operation.[3] Liner shipping companies consider offering value-added services in logistics as a means of securing faster growth and better profitability than accrues from their traditional shipping offering.[4] In addition, shipping companies providing logistics services can increase shippers' loyalty[5], because it enlarges customers' choice.

A number of shipping lines have provided not only the 'core service' but also 'logistics service' and therefore claimed that they are now offering a total package of integrated logistics service including international sea transport, inland transport, ware housing, documentation, and so on. Meanwhile, some Third Party Logistics providers (3PLs) and Ocean Transport Intermediaries (OTIs) such as international freight forwarders and Non-Vessel Operating Common Carriers (NVOCCs) have also expanded their market portfolio in this industry.

The idea of offering logistics services, however, is not a new one and has existed since

2 Bergin(1997), pp.45-47; Robinson(2002), pp.241-245.
3 Gray and Kim(2002).
4 Heaver(2002), pp.210-230.
5 Power(2003b), pp.25-27.

the early days of containerisation and before. An early example of diversification following the container revolution was that of Buyers and Shippers Enterprises set up by Sealand in 1972 in the United States. Subsequently, Maersk offered diversified services in Taiwan, Singapore and Hong Kong under the name of Mercantile in 1977; OOCL created Cargo System in 1979 and APL's ACS was incorporated in 1980. Elsewhere, NYK undertook warehousing and distribution services.

The evolution continued through the late 1980s and accelerated in the early 1990s.

Christopher (1998) supports the efforts of shipping lines by emphasising that the supply chain has come to be viewed as an integrated system, and that progressive organisations are willing to change their strategies if an efficient flow of goods and information is to be obtained. While growing customer sophistication represents an opportunity for those who have the capability to meet new service requirements, it is a threat for those without it.[6] By the mid-1990s, some shipping lines appreciated this logic and started to offer an additional range of services such as intermodal co-ordination, consolidation, warehousing, etc.

Table 1 shows the top 20 service operators of containerships in the world. The share of the top 20 liner operators increased by 15.5 per cent and reached 8.8 million TEUs.

Together, the 20 leading operators accounted for about 70 per cent of the total capacity deployed.[7] Maersk-Sealand's subsidiary company, Maersk Logistics, offers vendor management, labelling, packing, consolidation, preparation of the necessary paperwork, rapid customs clearance, warehouses, and cross-docking facilities. OOCL established Cargo System that manages the shipping, logistics and value-added services of imported products. NYK Line established an e-commerce system that enables customers to monitor and manage their supply chains online and launched New Wave Logistics, which consolidates and distributes cargoes in Europe. HMM set up Hyundai Inter-modal (US) that provides a standard road and rail intermodal service. Hanjin Shipping owns ten exclusive marine container terminal facilities linked to rail, barge

6 Power(2003b), ibid.
7 UNCTAD(2008), p.80.

and truck transportation, as well as six off-dock container yards. In addition, their intermodal Service Centre in Chicago tracks and monitors on-time arrivals.

<Table 1> Leading 20 service operators of containerships in 2008

Ranking	Operator	Country/territory	No. of ships in 2008	TEU capacity in 2008
1	Maersk Line	Denmark	446	1,638,898
2	MSC	Switzerland	359	1,201,121
3	CMA-CGM Group	France	238	701,223
4	Evergreen	Taiwan Province of China	177	620,610
5	Hapag Lloyd	Germany	142	491,954
6	COSCON	China	141	426,814
7	CSCL	China	122	418,818
8	APL	Singapore	117	394,804
9	OOCL	Hong Kong (China)	84	351,542
10	NYK	Japan	87	331,083
Subtotal			**1,913**	**6,576,867**
11	MOL	Japan	104	325,030
12	Hanjin	Republic of Korea	74	321,917
13	K Line	Japan	91	293,321
14	Yang Ming	Taiwan Province of China	83	276,016
15	Zim	Israel	84	243,069
16	Hamburg Sud	Germany	76	196,632
17	HMM	Republic of Korea	45	194,350
18	PIL	Singapore	72	140,135
19	Wan Hai	Taiwan Province of China	75	125,393
20	CSAV	Chile	48	108,927
Total 1-20			**2,665**	**8,801,657**
World container cellular fleet at 1 January 2008			**8,762**	**12,657,725**

Source: UNCTAD (2008), p.80.

8 Lloyd's List, 2003.
9 Power(2003b), ibid.
10 Power(2003a), pp.22-24.

However, there has been some criticism with respect to the provision of logistics services by shipping lines. Although shipping lines may possess a well-established network based on their global service operation and a high visibility throughout the entire supply chain, the provision of services outside their core service function requires additional investment, extra operating cost and very different skills[8]. It is not certain that the profitability of their logistics divisions will justify the investment[9]. For example, Hapag-Lloyd Container Line, which has concentrated on container shipping and has not offered logistics services, produced a profit of 98.2 million Euro in 2002 and a double-digit growth in volumes carried, while most other major shipping lines reported losses in 2002.[10] According to Thorby (2001), the core ocean carrying business requires significant investment and proper management and, therefore, shipping lines should stick to what they know best.

III. Empirical study

The paper seeks to develop an instrument which can measure logistics service operations. appears that most previous research about liner shipping services has focused on identifying the main determinants or attributes affecting shippers' carrier selection, placing an emphasis on statistical comparisons of the mean scores of various selection factors.[11] In other words, they tend to identify the critical elements of services and either enumerate or evaluate their relative influence. Some of them are solely related to the shippers' points of view[12], while others incorporate both the shippers' and the carriers' perspectives.[13]

However, the review of previous studies shows a lack of measurement and explanation of the service itself. This research focuses not on service elements but on

11 Murphy et al.(1997). pp.67-72.
12 Collison(1984), pp.40-54; Brooks(1995), pp.39-49; Stopford(1997).
13 Kent and Parker(1999), pp.398-408; Gibson et al.(2002), pp.669-681; Tiwari et al.(2003), pp.23-39.

service functions. In our empirical study logistics service functions were identified first, and selected by reviewing the relevant studies. To justify the initial selection of service functions, the functions discovered were verified by a panel of experts composed of 14 of which 6 from the UK, and 8 from South Korea in this field. Those functions verified by the panel were used in the subsequent analysis.

1. Research methodology

A postal survey of British and South Korean shippers was conducted to analyse the operation of the logistics service in the liner shipping industry. The selected sampling method was a probability sampling using a simple random sampling technique. The unit of analysis for this survey was defined as international shippers in the U.K. and/or South Korea who currently use container shipping services. We measured the satisfaction level of shippers from one to five.

Questionnaires were sent to 988 international shippers in the U.K. and 945 in South Korea registered on websites.[14] For the U.K. shippers, 89 questionnaires were returned with 72 classified as usable. For South Korea, 105 questionnaires were returned and 96 were usable. The overall response rate for the survey was, therefore, 9.0% for British shippers and 11.1% for South Korean shippers, and the usable response rates 7.3% and 10.2% respectively. shippers and 11.1% for South Korean shippers, and the usable response rates 7.3% and 10.2% respectively.

2. Results

1) T-test

Satisfaction levels of logistics service functions from the shippers of the two countries have been compared by conducting an independent T-test. Table 2 shows mean

14 www.tradepartners.gov.uk for the UK data, and www.kidb.co.kr for South Korea respectively.

differences between the two countries. Service functions which Korean shippers have the highest level of satisfaction are those of Obtaining Insurance Policy and Preparing Invoice. The most satisfactory service functions for British shippers are those of Paying for Freight and Paying customs duties. This implies that Korean shippers are more sensitive over papers service provision, while British shippers are highly satisfied with payment service functions.

When it comes to the statistical significance, the Table 2 provides the following discussions. First, the test for Equality of Variances indicates that variances for the British and South Korean shippers differ significantly from each other in Intermodal Co-ordination, Consolidating Shipments and Route Planning ($p = 0.05$). Second, the test for Equality of Means indicates that Intermodal Co-ordination, Booking Vessel Space, Scheduling Information, Consolidating Shipments, Tracking/Tracing, Paying Freight, Paying Port Charges, Paying Customs Duties and Issuing of Bill of Lading ($p = 0.05$) are those which show significant differences between the British shippers and South Korean shippers. Overall, British shippers appear to be more satisfied than South Korean shippers, as noted in the average percentage scores at the bottom of the Table 2.

However, the mean difference between the two countries is not statistically significant. From the statistical standpoint, Intermodal Co-ordination and Consolidating shipments are functions, which well and truly show the significant difference between the two countries. On the other hand, Issuing of Bill of Lading shows the largest mean difference but no difference in terms of the variance of each country. This can be explained by the assumption the variance of satisfaction of this function may largely be overlapped between the two countries.

<Table 2> T-test result of comparing means between the U.K. and South Korea

	Mean (S. Korea)	Mean (U.K.)	Mean difference	P value (Variance)	P value (Mean)
1 Intermodal Co-ordination	2.987	3.268	0.281	0.000*	0.037*
2 Reserving Cargo at Port	3.115	3.314	0.199	0.267	0.126
3 Container Handling at Port	3.187	3.360	0.173	0.341	0.208
4 Booking Vessel Space	3.163	3.438	0.275	0.497	0.036*
5 Con solidating Shipments	2.802	3.264	0.462	0.000*	0.001*
6 FCL Transport Operation	3.229	3.387	0.159	0.831	0.251
7 LCL Transport Operation	3.143	3.362	0.219	0.430	0.117
8 Route Planning	2.945	3.198	0.253	0.002*	0.063
9 Warehousing	3.109	3.365	0.256	0.724	0.054
10 ICDManagement	3.224	3.354	0.130	0.476	0.283
11 Tracking/Tracing	3.212	3.587	0.375	0.174	0.007*
12 Printing Document	3.355	3.235	-0.120	0.152	0.405
13 Scheduling Information	3.100	3.351	0.251	0.402	0.040*
14 Paying Freight	3.249	3.723	0.474	0.712	0.000*
15 Paying PortCharges	3.166	3.530	0.365	0.960	0.003*
16 Paying Insurance Premiums	3.266	3.487	0.221	0.503	0.103
17 Paying Customs Duties	3.193	3.564	0.371	0.607	0.005*
18 Issuing of Bill of Lading	2.870	3.456	0.587	0.172	0.000*
19 Preparing Invoice	3.445	3.255	-0.190	0.087	0.160
20 Obtaining Insurance Policy	3.494	3.298	0.196	0.451	0.158
21 Customs Clearance	3.107	3.340	0.223	0.573	0.109
AVERAGE	**3.160**	**3.387**			

*significant at the 0.05 level

2) ANOVA

In this section, we examine whether the logistics provision by a service provider is more appreciated than other service providers on each service function. Service providers are classified into four categories - shipping lines (S.L), freight forwarders (F.F), Non-Vessel Operating Common Carriers (NVOCC) and own company (O.C). Respondents of the survey gave scores reflecting the quality of different attributes. We have run a one-way ANOVA to test whether respondents have significant opinion differences with regard to the service providers. Table 3 presents results of ANOVA for 21 services provided by four different categories of logistics service providers.

We find that three service functions such as intermodal Co-ordination, Paying Customs Duties, and Issuing of Bill of Lading show a large mean difference of service performance among the service providers. This implies that shippers perceive that the service quality of these functions among firms is significantly different. That is, shippers' satisfaction level varies largely depending on which category of service providers has served the shipper. For these three functions, an additional analysis of multiple comparisons between the groups was conducted. As a result of Post hoc tests for the Intermodal Co-ordination function, the mean difference is significant at the 0.05 level [S.L and NVOCC (0.003), F.F and NVOCC (0.019), NVOCC and O.C (0.001)].

For the Issuing of Bill of Lading function, the mean difference was marginally significant between S.L and O.C (0.054). For the Paying Customs Duties function, the Post hoc test could not be performed because one group (NVOCC) contains fewer than two cases. It can be concluded that the provision of logistics services by the different types of service providers was somewhat similarly perceived by the shippers.

<Table 3> One-way ANOVA result of logistics service providers

	Mean scores				F ratio	P value
	S.L	F.F	NV OCC	O.C		
1 Intermodal Co-ordination	3.347	3.014	2.000	3.384	5.678	0.001*
2 Reserving Cargo at Port	3.282	3.211	2.714	3.274	0.898	0.444
3 Container Handling at Port	3.235	3.204	3.000	3.250	0.089	0.966
4 Booking Vessel Space	3.433	3.270	2.750	3.072	1.739	0.162
5 Consolidating Shipments	3.222	3.096	3.000	2.966	0.308	0.819
6 FCL Transport Operation	3.365	3.248	3.000	3.563	0.985	0.402
7 LCL Transport Operation	3.249	3.144	3.083	3.524	1.079	0.360
8 Route Planning	2.927	3.090	3.125	2.956	0.239	0.869
9 Warehousing	3.150	3.249	3.571	3.354	0.544	0.653
10 ICD Management	3.237	3.378	3.286	3.227	0.241	0.867
11 Tracking/Tracing	3.470	3.247	2.667	3.550	2.169	0.095
12 Printing Document	3.212	3.357	3.167	3.388	0.334	0.801
13 Scheduling Information	3.174	3.163	3.041	3.238	0.138	0.937
14 Paying Freight	3.762	3.597	3.200	3.321	1.824	0.145
15 Paying Port Charges	3.615	3.265	2.500	3.304	1.910	0.131
16 Paying Insurance Premiums	3.750	3.253	4.000	3.344	0.528	0.664
17 Paying Customs Duties	3.500	3.553	1.000	3.255	3.436	0.019*
18 Issuing of Bill of Lading	2.853	3.254	2.917	3.588	2.668	0.050*
19 Preparing Invoice	3.250	3.162	2.667	3.505	2.041	0.111
20 Obtaining Insurance Policy	3.667	3.478	2.500	3.442	0.778	0.508
21 Customs Clearance	3.000	3.253	2.333	3.223	0.949	0.419
AVERAGE	**3.319**	**3.261**	**2.834**	**3.320**		

*S.L.: Shipping Lines, F.F.: Freight Forwarders, NVOCC: Non-Vessel Operating Common Carriers, O.C.: Own Company

**significant at the 0.05 level

IV. Conclusion

The container liner shipping industry is being transformed as a result of a changing situation, including more sophisticated shippers' demands, the development of information technology, the emergence of new shipping regulation and depressed freight rates or profits of liner shipping companies. Consequently, liner shipping companies, as well as other transport intermediaries such as freight forwarders and NVOCCs, include a wider range of service functions in their business activities.

The paper explores service diversification of container shipping industry. We have identified service functions which were not traditionally in the list of business activities of shipping companies. A survey was conducted to test whether the shippers of the two countries were satisfied with the provision of service functions differently, and what functions were most valued. The T-test and a One-way ANOVA were used in the empirical study.

The paper finds that, as a whole, the British shippers are more satisfied than South Korean shippers. The ANOVA results suggest the following theoretical explanation on the performance of logistics service operation depending upon service providers.

Although the overall logistics service functions among the different types of service providers showed somewhat similar results, three service functions such as Intermodal Co-ordination, Paying Customs Duties, and Issuing of Bill of Lading were identified as showing the difference of service performance among service providers.

The research, however, presents a limitation. The paper focuses solely on the shipper's perspective. Data were collected from only 168 international shippers from the U.K. and South Korea, thus caution must be exercised when making any broad generalisations based on such a sample. Nevertheless, the methodology applied in this study can be deemed to be a valid option for future research in the field.

Although the current research was limited to an examination of shippers' perceptions within a two-country context, it is believed that the research findings can help explain customer assessment of service provision in a wider variety of industries than just container shipping. In addition, future studies of shipper perceptions of liner shipping services should consider the patterns of service operated by carriers and how they may differ from one carrier to another. This would yield a greater understanding of perceptions and the assessment of logistics service operations.*

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